

REMARKS

Claims 1, 4-18 and 31 are under examination. Claims 1, 10, 12, and 31 are herein amended. Claims 19-23 and 25-27 have been withdrawn.

Claim amendments

Claim 1 has been amended to further describe the reflective surface of the invention. Support for this amendment is found on page 11, lines 16-24 of the Specification.

Claim 10 has been amended to correct the dependency so that it no longer depends from a cancelled claim.

Claims 12 and 31 have been amended to recite a roughly v-shaped bottom surface and the reflective surface of the invention. Support for these amendments is found in claim 1 and in the Specification on page 11, lines 16-24.

No new matter has been added.

1. Rejection Under 35 U.S.C. § 102

The Examiner rejects claims 12-14 as being anticipated by Agrawal et al., U.S. Patent 7,195,872 (hereinafter "Agrawal").

a. The spot parts are not equivalent to either cones or pillars

The Examiner states that "[a]s to claim 12, the microfeatures comprising pillars, and micro-rods, each are equivalent to the claimed protruding part with a flat surface for immobilizing biomolecules." Applicants respectfully traverse.

Applicants have amended claim 12 to recite a v-shaped bottom and the reflective surface of the invention. Agrawal discloses neither the v-shaped bottom or the particular reflective

characteristics of the present invention. Thus, Applicants submit that Agrawal does not teach each element of the invention. Applicants request that the rejection be withdrawn.

b. Claim 13

The Examiner does not explicitly disclose why claim 13 is anticipated by Agrawal, but the Examiner states: “[t]he electrical contact is with the surface of the substrate that includes portions other than the microfeatures (protruding spot parts.) The gold material is conductive.” As discussed above, Agrawal does not anticipate the present invention because Agrawal does not disclose the v-shaped bottom.

2. Rejection Under 35 U.S.C. § 103

The Examiner rejects claims 1, 4-11, 15, 16, and 31 under 35 U.S.C. § 103 as unpatentable over Agrawal. The Examiner states that Agrawal “do[es] not disclose that the protruding spot part has a flat surface and forms a roughly V-shaped bottom surface.” The Examiner continues, stating that, based on the shapes disclosed as “microstructures” in Agrawal, “the skilled artisan is suggested to use any of a variety of shapes, such as a trapezoid such that the bottom surface of the substrate forms a roughly V-shaped bottom surface, as such shape would still serve the purposes disclosed by Agrawal et al. of increasing the surface area of the substrate.” Applicants respectfully disagree.

a. Agrawal does not suggest the spot parts of the present invention.

As the Examiner points out, Agrawal discloses both “pillars” and “cones.” (Agrawal, paragraph [0020]). Applicants submit that the v-shaped bottom of the present invention is not equivalent to either a pillar or a cone.

In particular, the shape of the base of the spot forms the V-shaped channel, which has a specific function related to reflectivity, thus is not equivalent to a pillar. The Specification discloses the purpose of the V-shaped bottom surface on page 11, lines 16-24:

On such a substrate, the intensity of light reflected from the flat surface for spotting that is detected by the confocal detector is greater than the intensity of light reflected from portions other than the flat surface for spotting on the substrate. Thus, this difference in the intensity of reflected light can be used to specify the position and size of the flat surface for spotting.

(See also, Specification, Example 2, figure 9). Similarly, the flat top of the spot is not equivalent to a cone because it serves the purpose of providing the flat surface for the biomolecule immobilization. Thus, Agrawal does not disclose each and every element of the invention, and therefore does not make obvious the invention. Applicants request that the rejection be withdrawn.

b. Agrawal does not suggest the reflective surface of the present invention.

Even if the Examiner found that the cones and pillars of Agrawal were equivalent to the spot parts of the present invention, Agrawal does not disclose the reflective features of the present invention. Specifically, in Agrawal, the embodiment wherein the pillar-type microfeature is employed (e.g., Agrawal fig 1(b)) is intended to be porous. (See Agrawal [0162], describing the etching to produce porous “raised features” where the substrate in the wells between the raised features is not porous).

In contrast the spot parts of the present invention are not porous because “the microarray in which biomolecules are immobilized on the flat surface of the top of a protruding spot part . . . information on the spots such as the presence or absence of interaction with a target biomolecule can be detected with high sensitivity.” (Specification, page 9, lines 14-17). This presence or absence of biomolecules may be determined through “the detection of fluorescence with a confocal detector.” (Specification, page 20, lines 27-30). Thus, even if the shapes of pillars or cones as disclosed in Agrawal are considered to be equivalent to the spot parts of the present invention, the porous characteristic of the features in Agrawal would render those features non-operational in the present invention.

Even further, the Specification discloses that when the top of the spot part “reflects light, the reflected light can be used to specify the size and position of biomolecule-immobilized spots to conduct automated gridding.” (Specification, page 12, lines 10-12). Agrawal does not suggest

this additional advantage of the present invention which is directly attributable to the shape and reflective characteristics of the spot part. As discussed above, the embodiment of Agrawal which the Examiner cites as suggesting the present invention would actually make the present invention not operate for its intended purpose. Thus, Applicants submit that Agrawal does not make obvious the present invention. Applicants request that the rejection be withdrawn.

Consequently, Agrawal does not anticipate the present invention. Applicants request that the rejection be withdrawn.

CONCLUSION


The favorable action of allowance of the pending claims is respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mark J. Nuell, Ph.D. (Reg. No. 36,623) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 
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